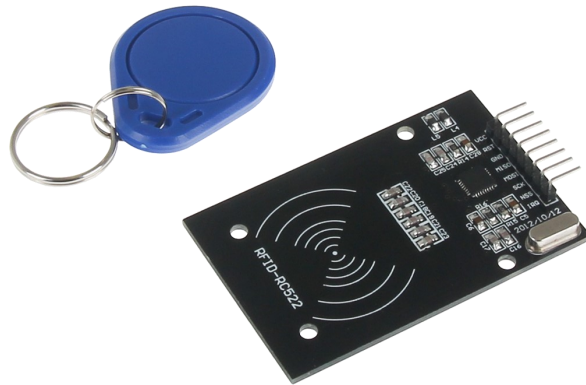


JOY-IT



RFID Module
based on NXP MFRC-522

TABLE OF CONTENTS

1. Overview
2. Pin-Assignment
3. Using with an Arduino
 - 3.1 Connecting the module
 - 3.2 Installing the module
 - 3.3 Example application
4. Using with a Raspberry Pi
 - 4.1 Connecting the module
 - 4.2 Setting up the system
 - 4.3 Installing the module
 - 4.4. Example application
5. Information- and take-back obligations
6. Support

1. OVERVIEW

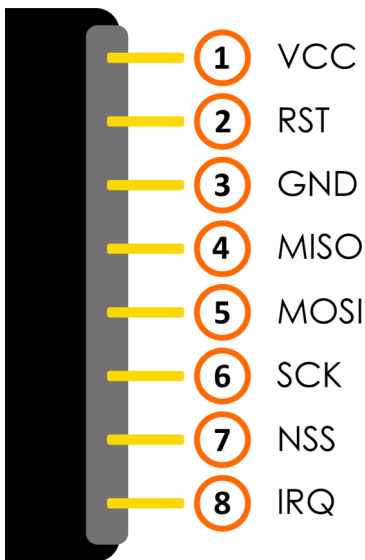
Dear customer,

Thank you very much for choosing our product.

In the following we will show you what has to be observed during commissioning and use. Should you encounter any unexpected problems during use, please feel free to contact us.

Frequency	13,56 MHz
Communication	SPI
RFID Protokoll	Mifare
Power Supply	DC 3,3V

2. PIN-ASSIGNMENT

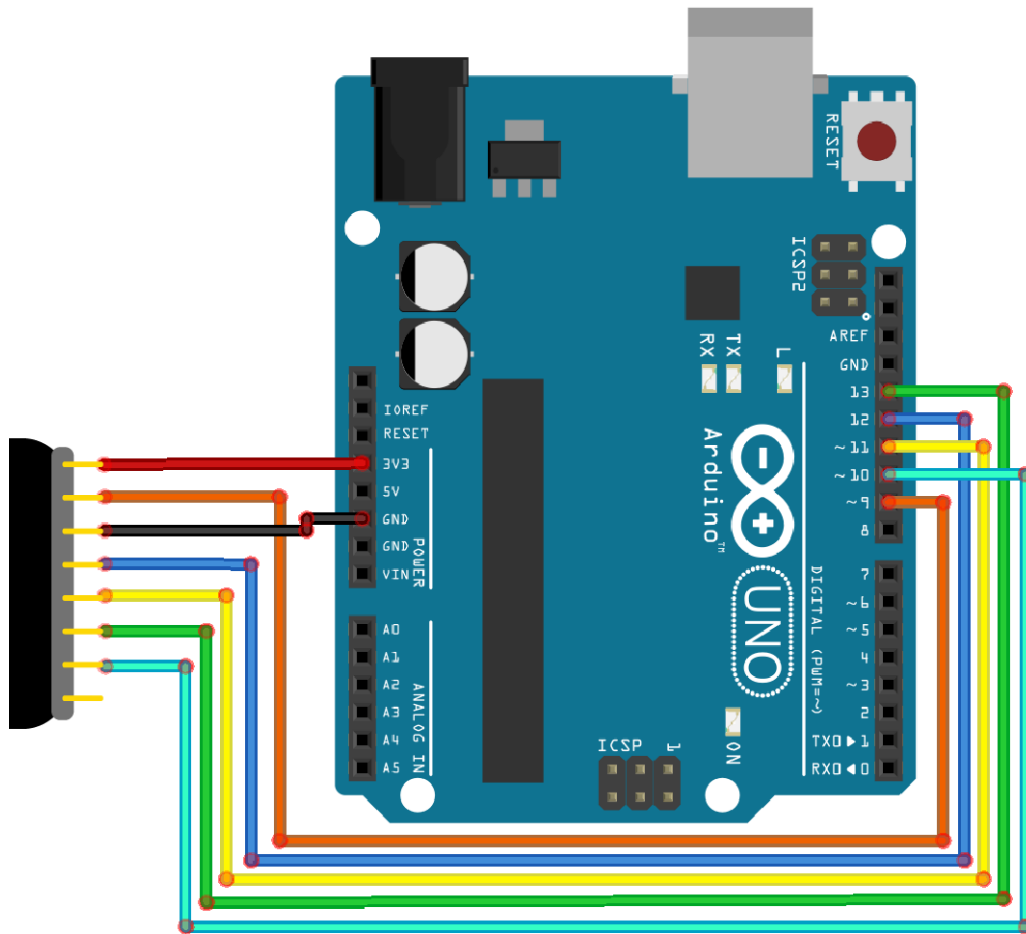


Assignment		
RFID Module	Arduino	Raspberry Pi
VCC	3,3V	1 (3,3V)
RST	9	22 (BCM 25)
GND	GND	6 (GND)
MISO	12	21 (BCM 9)
MOSI	11	19 (BCM 10)
SCK	13	23 (BCM 11)
NSS	10	24 (BCM 8)
IRQ	/	/

3. USING WITH AN ARDUINO

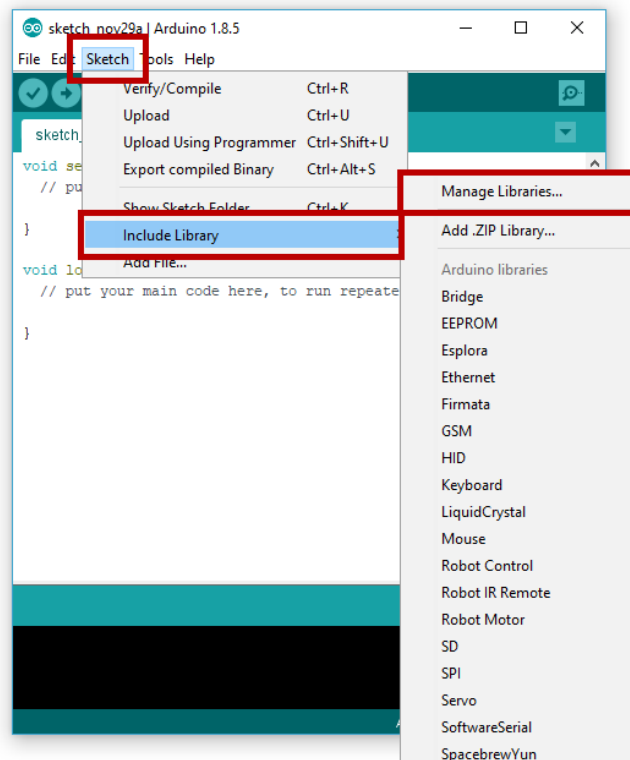
3.1 CONNECTING THE MODULE

Connect the RFID module to the pins of your Arduino as shown in the following picture and in the table in Chapter 2.

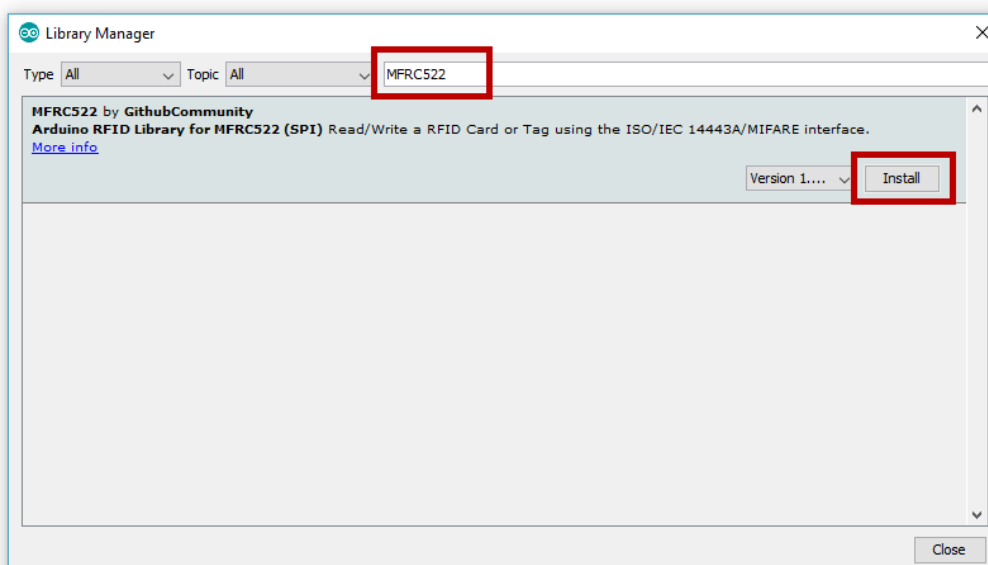


3.2 INSTALLING THE MODULE

In order to use the module with your Arduino, it is first necessary to install the **MFRC522** library from the Arduino library manager.



In the window that opens, enter the term "**MFRC522**" in the search field and install the library.



3.3 EXAMPLE APPLICATION

After you have successfully installed the library, your module is ready for use. You can use the following code example and transfer it to your Arduino to start up and test the module.

```
#include <SPI.h>
#include <MFRC522.h>

#define RST_PIN      9
#define SS_PIN       10

MFRC522 mfrc522(SS_PIN, RST_PIN);

void setup() {
  //Initialisierung des RFID-Moduls
  Serial.begin(9600);
  while (!Serial);
  SPI.begin();
  mfrc522.PCD_Init();
  mfrc522.PCD_DumpVersionToSerial();    //Details des Lesegerätes ausgeben
  Serial.println(F("Scan PICC to see UID, type, and data blocks..."));
}

void loop() {
  //Suche nach neuen Karten
  if ( ! mfrc522.PICC_IsNewCardPresent() ) {
    return;
  }

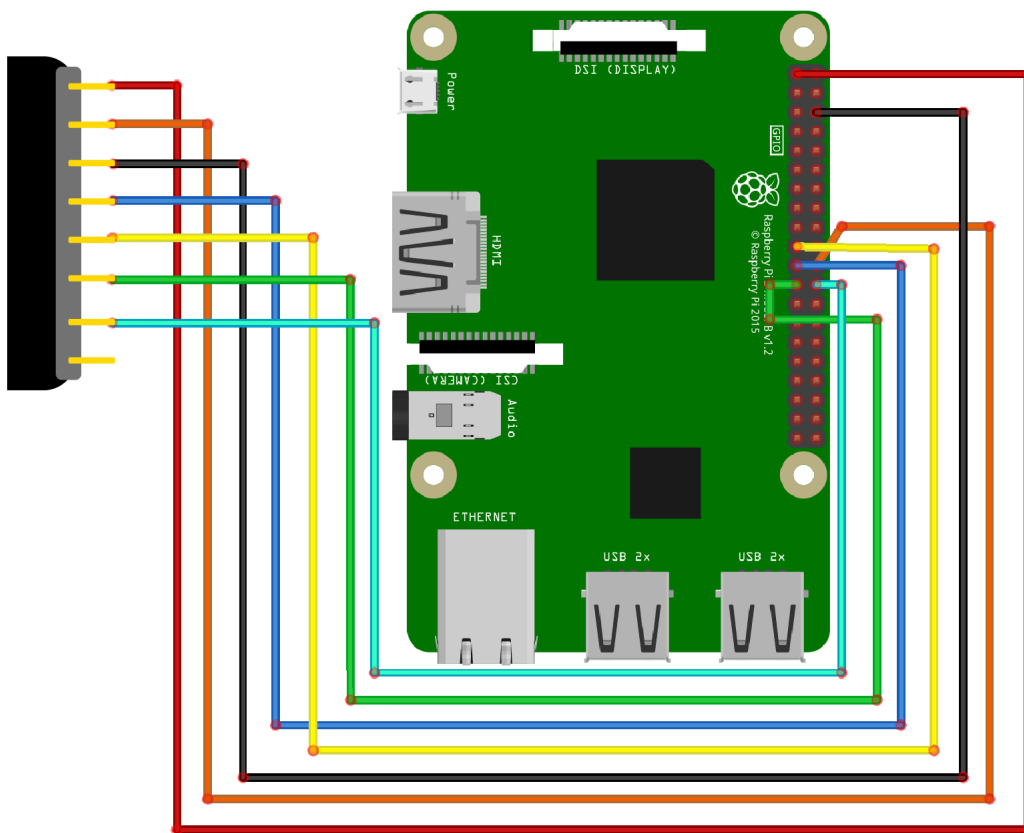
  if ( ! mfrc522.PICC_ReadCardSerial() ) {
    return;
  }

  //Informationsabruf des RFID-Gerätes
  mfrc522.PICC_DumpToSerial(&(mfrc522.uid));
}
```

4. USING WITH A RASPBERRY PI

4.1 CONNECTING THE MODULE

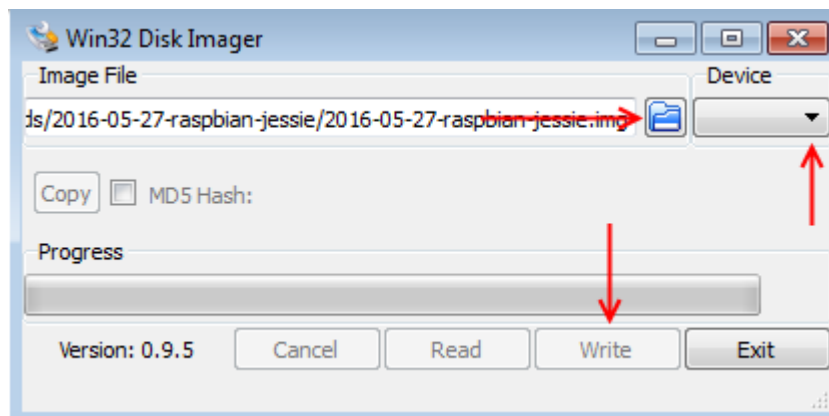
Connect the RFID module to the pins of your Raspberry Pis as shown in the following figure and in the table in Chapter 2.



4.2 SETTING UP THE SYSTEM

If you are already using a current Raspbian system on your Raspberry, you can skip this step and proceed immediately to step 3.

First download the latest version of the Raspbian operating system [here](#). With the help of a suitable program (e.g. „[Win32 Disk Imager](#)“) you can install the downloaded image file on a micro-SD card.



Once the process is complete, you can insert the micro-SD card into your Raspberry Pi and start it.

4.3 INSTALLING THE MODULE

Before you can use the module, it is necessary to install additional libraries. Open a terminal window on your Raspberry Pi and enter the following commands:

```
sudo apt-get install python-pip python-dev build-essential
sudo pip install RPi.GPIO
```

Now open the config.txt file with the following command:

```
sudo nano /boot/config.txt
```

Add the following lines to the end of the file:

```
dtparam=spi=on
```

Save the file with the key combination **CTRL+O**, confirm with Enter and exit the editor with the combination **CTRL+X**.

Restart your Raspberry Pi:

```
sudo reboot
```

Now that the preparations have been completed, the actual library can be installed:

```
sudo apt-get install git python-def --yes
git clone https://github.com/lthiery/SPI-Py.git
cd SPI-Py
sudo python setup.py install
cd ..
git clone https://github.com/pimylifeup/MFRC522-python.git && cd MFRC522-python
```

Now the scripts for writing and reading the data have to be written.

Enter the following command to create the script for reading:

```
sudo nano Read.py
```

Enter the following script in this file:

```
#!/usr/bin/env python

import RPi.GPIO as GPIO
import sys sys.path.append('/home/pi/MFRC522-python')
from mfrc522 import SimpleMFRC522

reader = SimpleMFRC522()

print("Now place tag next to the scanner to write")
try:
    id, text = reader.read()
    print(id)
    print(text)
finally:
    GPIO.cleanup()
```

Now enter the following command to create the script for writing:

```
sudo nano Write.py
```

Enter the following script in this file:

```
#!/usr/bin/env python

import RPi.GPIO as GPIO
import sys
sys.path.append('/home/pi/MFRC522-python')
from mfrc522 import SimpleMFRC522
reader = SimpleMFRC522()

try:
    while True:
        text = raw_input("Your Text: ")
        print("Now place tag next to the scanner to write")
        id, text = reader.write(text)
        print("recorded")
        print(id)
        print(text)
        break
finally:
    GPIO.cleanup()
```

4.4 EXAMPLE APPLICATIONS

The library now installed already contains sample applications for reading and writing. You can start the application for reading with the following command:

```
sudo python Read.py
```

Run the file to write a clip or a card with the following command:

```
sudo python Write.py
```

5. INFORMATION- AND TAKE-BACK OBLIGATIONS

Symbol on electrical and electronic equipment



This crossed-out dustbin means that electrical and electronic appliances do not belong in the household waste. You must return the old appliances to a collection point. Before handing over waste batteries and accumulators that are not enclosed by waste equipment must be separated from it.

Return options

As an end user, when you purchase a new device, you can return your old device (which essentially fulfils the same function as the new one purchased from us) free of charge for disposal. Small appliances with no external dimensions greater than 25 cm can be disposed of in normal household quantities independently of the purchase of a new appliance.

Possibility of return at our company location during opening hours

Simac GmbH, Pascalstr. 8, D-47506 Neukirchen-Vluyn

Possibility of return near you

We will send you a parcel stamp with which you can return the device to us free of charge. Please contact us by e-mail at Service@joy-it.net or by telephone.

Information on packaging

If you do not have suitable packaging material or do not wish to use your own, please contact us and we will send you suitable packaging.

6. SUPPORT

We are also there for you after the purchase. If you still have questions or problems, we are also available by e-mail, telephone and ticket support system.

E-Mail: service@joy-it.net
Ticket-System: http://support.joy-it.net
Phone: +49 (0)2845 98469 – 66 (9:30 - 17:00 Uhr)

For further information please visit our website:

www.joy-it.net